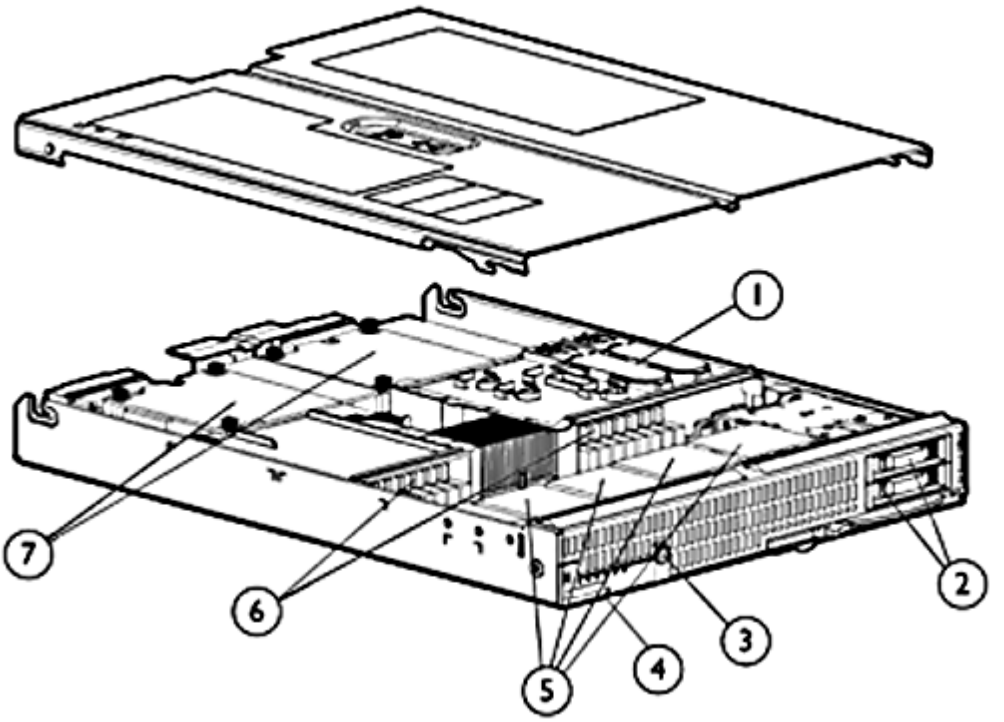
HP ProLiant BL680c Generation 5 (G5) Server Blade



Front view image

1. Cache Battery modules
2. Two small form factor (SFF) hot-plug drive bays
3. Power Button
4. Local I/O connector
5. Up to four Intel® Quad-core Xeon® 7300 processors
6. Up to 64 GB PC2-5300, DDR2 FB DIMMS
7. Three Mezzanine Slots

At A Glance

This document covers the HP ProLiant BL680c G5 server blade only. For more information on HP BladeSystems c-Class Infrastructure and HP BladeSystem c-Class Interconnects, please see the following QuickSpecs:
HP BladeSystem c-Class Infrastructure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.HTML
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_na/12524_na.HTML

- The HP ProLiant BL680c G5 delivers no-compromise performance and expansion in the densest 4P server blade form-factor available to handle your most demanding applications. The HP ProLiant BL680c server blade G5 includes:
- Processor:
  - Up to four Quad-Core Intel® Xeon® 7300 series processors
  - Intel 7300 chipset
- Memory:
  - Up to 64 GB of memory supported by sixteen (16) PC2-5300, Fully-Buffered DIMMs at 667 MHz
  - Advanced ECC memory support
  - Supports memory interleaving (2 x 1), memory mirroring, and online spare capacity
- Storage Controller:
  - Integrated HP Smart Array P400i Controller with 256MB cache (optional BBWC) supports RAID 0/1

Overview

- Internal Drive Support:
  - Up to Two (2) small form factor (SFF) SAS or SATA hot-plug hard drives
- Network Controller:
  - Four (4) embedded network adapter (NIC) ports, plus one (1) additional management NIC port:
    - One (1) embedded NC326i Dual Port Gigabit Server Adapter
    - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine for Microsoft Windows
    - One (1) additional embedded 10/100 NIC dedicated to iLO 2 management
- Mezzanine Support:
  - Three (3) additional I/O expansion slots via mezzanine card
  - Supports up to three (3) mezzanine cards:
    - Dual-Port Fibre Channel Mezzanine (4-Gb) options for SAN connectivity (Choice of Emulex or QLogic)
    - Ethernet NIC mezzanine options for additional network ports
      - HP NC325m PCI Express Quad Port 1Gb Server Adapter
      - HP NC326m PCI Express Dual Port 1Gb Server Adapter
      - HP NC373m PCI Express Dual Port Multifunction Gigabit Server
      - HP NC512m Dual Port 10GbE Multifunction BL-c Adapter
    - 4X DDR InfiniBand (IB) Mezzanine (20 Gb/s) options for low latency server interconnectivity (based on Mellanox technology)
- Internal USB Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
- Form Factor:
  - HP ProLiant BL680c G5 server blade plugs vertically into the HP BladeSystem c7000 enclosure, 8 server blades supported per 10U enclosure
- Operating Systems:
  - Supports Windows and Linux Operating Systems
- Management:
  - Integrated Lights-Out 2 Standard Blade Edition with virtual KVM graphical remote console at no additional cost
- Enclosures:
  - The HP BladeSystem c7000 enclosure is 17.4in (442 mm) in height, 17.5in (445 mm) wide and holds up to 8 HP ProLiant BL680c G5 server blades plugged vertically.
  - Server blades, storage blades, interconnect modules, power supplies, fans, and redundant Onboard Administrator modules are all designed to fit into the c7000 enclosure.
- Warranty:
  - Protected by HP Services and a worldwide network of HP Authorized Channel Partners. Three-year parts, 3 Year Labor and 3 Year on-site limited global warranty. Certain restrictions and exclusions apply. SATA hard drives have a one year warranty.

Standard Features (Server Blade)

Processor	Quad-Core Intel® Xeon® Processor E7340 (2.40/2x4M 80W QC 2P Kit) Quad-Core Intel® Xeon® Processor E7330 (2.40/2x3M 80W QC 2P Kit) Quad-Core Intel® Xeon® Processor E7320 (2.13/2x2M 80W QC 2P Kit) Quad-Core Intel Xeon Processor E7310 (1.60/2X2M 80W QC 2P Kit) Quad-Core Intel Xeon Processor L7345 (1.86 GHz/2x4M 50W QC 2P kit)* (Low Voltage) Dual-Core Intel Xeon Processor E7220 (2.93 GHz/2x4M 80W DC 2P kit)* NOTE: For the Intel 7300 series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage. * Offered through Configure-To-Order only. See Factory Integrated Models section for more details.	
Upgradeability	N/A	
Cache Memory	2x4MB Level 2 cache memory 2x3MB Level 2 cache memory 2x2MB Level 2 cache memory	
Chipset	Intel® 7300 Chipset	
Memory	Type	PC2-5300 Fully Buffered DIMMs running at 667 MHz
	Standard	2 GB (2 x 1 GB) 4 GB (4 x 1 GB)
	Maximum	64 GB (16 x 4 GB)
	NOTE: Memory must be installed in pairs.	
Network Controller	Four (4) embedded NIC ports, plus (1) additional management NIC port: One (1) embedded NC326i Dual Port Gigabit Server Adapter Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine for Microsoft Windows One (1) additional embedded 10/100 NIC dedicated to iLO 2 management	
Expansion Slots	Three Mezzanine slots (Two x8 and one x4)	
Integrated Manageability	Integrated Lights-Out 2 Standard Blade Edition (iLO 2)	
Storage Controller	HP Smart Array P400i Controller	256MB memory module supports RAID 0/1/1+0/5 Available upgrades: Battery-backed write cache (BBWC) or 512MB memory module with battery-backed write cache (BBWC) (both upgrades support RAID 0/1)

Standard Features (Server Blade)

Maximum Internal Storage	Hot Plug Serial Attach SCSI (SAS)	292GB SAS	2 x 146GB Serial SCSI

Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 memory)

Graphics Resolution Supported	Resolution Color Depths	Depths 1280 x 1024, 16.7M , 64k, 256,16 1024 x 768, 16.7M, 64k, 256, 16 800 x 600, 16.7M, 64k, 256, 16 640 x 480, 16.7M, 64k, 256, 16

Fibre Channel on the HP ProLiant BL680c G5 server blade

Two optional Fibre Channel HBAs are supported by the HP ProLiant BL680c G5. Both mezzanine circuit boards connect directly to the server blade system board. These Fibre Channel HBAs are available via option kits ordered separately.

Emulex LPe1105-HP 4Gb FC HBA for HP c-Class BladeSystem (403621-B21)

- Based on the same field-proven ASIC, firmware, and driver technology as Emulex's renowned LPe1150 HBA, the Emulex LPe1105-HP is fully driver compatible with all Emulex HBAs

QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (403619-B21)

- Uses common drivers which means that customers can standardize on one QLogic driver whether they are using the QMH2462 or other 4Gb and 2Gb HBAs powered by QLogic

Emulex and QLogic Fibre Channel HBAs feature:

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds
- Dual-ports for redundant path connections
- Up to two FC HBAs per server blade providing redundant FC HBA support
- Optimized for HP StorageWorks and supported by third party SAN vendors
- Support for Microsoft® Windows® and Linux operating systems environments

Compatible SAN

HP ProLiant BL680c G5 server blades are optimized for HP StorageWorks MSA, EVA, and XP
HP ProLiant 680c G5 server blades are compatible with select third party SANs (please see blade storage page for more details: http://h18000.www1.hp.com/products/servers/proliant-bl/c-Class/storage.html)

Insight Control Environment for BladeSystem

Starting July 9, 2007, HP Insight Control management suites and most HP ProLiant Essentials will include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Insight Control Environment for BladeSystem delivers foundation management for HP BladeSystem lifecycles, including hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability, scanning and patch management.

Installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager
- HP iLO Select Pack
- HP Insight Power Manager
- HP ProLiant Essentials Rapid Deployment Pack
- HP ProLiant Essentials Performance Management Pack
- HP ProLiant Essentials Vulnerability and Patch Management Pack
- HP ProLiant Essentials Virtual Machine Management Pack

Additional ProLiant Essentials software and management tools included on the Insight Control Management DVD can be installed manually.

- Server Migration Pack
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

NOTE: Server Migration Pack - Physical to ProLiant Edition can be installed from the SMP-P2P CD included in the Insight Control Management media kit.

NOTE: Insight Control Data Center Edition can be installed from the Insight Control Management DVD, which can be delivered with HP BladeSystem c-Class enclosures with a choice of licensing options. Licensing options include a free 30 day evaluation license for 8 servers (default option for every enclosure order), a full purchased license for 8 blade servers or a full purchased license for 16 blade servers). For additional information on HP c-Class Infrastructure please visit: HP BladeSystem c-Class Infrastructure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.HTML

NOTE: For additional product and licensing information about Insight Control Environment for BladeSystem, HP Systems Insight Manager and Essentials software refer to http://www.hp.com/servers/proliantessentials.

Standard Features

Unified Foundation Management and Essentials Software	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
	ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) extends HP Systems Insight Manager with a complete deployment solution for HP ProLiant blade servers. RDP provides a central location to configure server hardware, deploy Windows, Linux and VMware ESX operating environments and install HP ProLiant Support Pack drivers using images and scripted profiles.
	ProLiant Essentials Performance Management Pack	Performance Management Pack (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
	Virtual Machine Management Pack	Virtual Machine Management Pack - provides central management and control of virtual machines from Microsoft and VMware. Integrated approach provides the ability to manage both physical and virtual resources from a single management console.
	Vulnerability and Patch Management Pack	Vulnerability and Patch Management Pack (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms, and other blended threats.
	Insight Management Agents	The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers. Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ProLiant Support Packs and ROMPaq, software	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the ProLiant Essentials Rapid Deployment Pack, SmartStart or downloaded from Software and Drivers download pages website at http://www.hp.com/go/support.

Standard Features

Optional ProLiant Essentials Value Packs

Optional software offerings that selectively extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- Server Migration Pack - The Server Migration Pack automates the manual processes required for migrating servers between physical or virtual platforms (P2V, V2P, and V2V).
- Server Migration Pack - P2P Edition: Upgrading or replacing your existing server? Effortlessly transition to new servers with automated, accurate and affordable migration of OS, application and data.
- Virtualization Management Software - Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager. The Virtual Machine Management Pack plug-in provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association. The Server Migration Pack plug-in automates the manual task of migrating servers between physical or virtual platforms.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

NOTE: Selected software packages listed here include one year of 24 x 7 Software Technical Support and Update Service. If you have any questions about this service please visit the HP website at http://www.hp.com/services/insight

Optional Remote Management

- Insight Control Environment for BladeSystem is based on HP Systems Insight Manager and ProLiant Essentials software, and brings the value of Insight Control to ProLiant customers by delivering comprehensive health and performance monitoring, remote control, vulnerability scanning and patch management as well as flexible deployment and power management through an integrated installation package and streamlined licensing. For more information, visit: http://www.hp.com/go/ice
- Integrated Lights-Out Select Pack - upgrades the Integrated Lights-Out processor with enhanced console sharing and replay, scripted and command line virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting and power capping on selected models and enterprise security (directory services and two factor authentication).
- Insight Power Manager (IPM) - upgrades the single-server remote management capabilities of iLO Select/Advanced to include centralized reporting and policy-based management of power consumption and thermal output provided by the Insight Power Manager. IPM unifies all of this functionality within a single user interface - HP Systems Insight Manager.
- Integrated Lights-Out Power Management Pack for BladeSystem is energy-efficient management software that delivers centralized control, reliable security, and energy savings for your ProLiant or BladeSystem infrastructure. iPMP combines the total control of iLO 2 Advanced in the area of remote management with the energy monitoring and control of the Insight Power Manager to deliver a robust solution capable of full remote control and power management of ProLiant servers through a unified interface within HP Systems Insight Manager.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

NOTE: Selected software packages listed here include one year of 24 x 7 Software Technical Support and Update Service. If you have any questions about this service please visit the HP website at http://www.hp.com/services/insight

Standard Features

SmartStart

SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart 7.60 and later can now deploy the HP ProLiant BL680c G5 using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server order or download your copy from the SmartStart web site. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart.

OS Support

Microsoft Windows 2000 Server
Microsoft Windows 2000 Advanced Server
Microsoft Windows Server 2003, Standard Edition
Microsoft Windows Server 2003 R2, Standard Edition
Microsoft Windows Server 2003, Standard x64 Edition
Microsoft Windows Server 2003 R2, Standard x64 Edition
Microsoft Windows Server 2003, Web Edition
Microsoft Windows Server 2003 R2, Web Edition
Microsoft Windows Server 2003, Enterprise Edition
Microsoft Windows Server 2003 R2, Enterprise Edition
Microsoft Windows Server 2003, Enterprise x64 Edition
Microsoft Windows Server 2003 R2, Enterprise x64 Edition
Red Hat Enterprise Linux
SUSE Linux Enterprise Server

NOTE: For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos.
NOTE: For an up-to-date listing of the latest drivers available for the ProLiant BL c-Class, please see: http://www.compaq.com/support/files/server/us/index.html.
NOTE: For more Linux OS support & certification information, please visit our the ProLiant & Bladesystem Server Linux matrix http://h18004.www1.hp.com/products/servers/linux/hpLinuxcert.html

Supported Software Options

VMware Virtualization Software

NOTE: For more information on HP's Certified and Supported HP ProLiant Servers, please visit the VMware Server Support Matrix at:
http://h18004.www1.hp.com/products/servers/software/vmware/hpvmwarecert.html

Integrated Manageability

Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

- Virtual KVM based remote console
- Virtual media (single server, browser based access only)
- Remote Serial Console
- Virtual Power Button Control
- Virtual Unit ID control
- Integrated Remote Console (ActiveX Control client)
- Dedicated network connectivity
- OS independent hardware health status Present server power consumption
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)
- Advanced Encryption Standard (AES)/Triple Data Encryption Standard (3DES)
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege
- Single sign-on from HP BladeSystem Onboard Administrator

Standard Features

Availability	Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection Four (4) embedded Gigabit Ethernet adapters for redundant LAN connections Four (4) hot-plug SAS/SATA hard drive bays and integrated RAID (HP Smart Array P400i) controller on every server blade (Battery-backed write cache is optional) Redundant ROM on each server blade Advanced ECC Memory - can correct a multi-bit error (up to 4 bits) that occurs within one memory chip Memory Mirroring Memory Online Spare Capacity Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)
Security	One (1) internal USB 2.0 connector for security key devices and USB drive keys Power-on password Administrator's password Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption Integrated Lights-Out 2 can be disabled via a Global Setting
Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSA1000, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services on your specific server model please contact your sales representative or go to http://www.hp.com/go/factory-express.
HP Enterprise Configurator	The HP eCo-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Standard Features

Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

NOTE: Server Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

HP Care Pack services provide total care and support expertise with committed response designed to meet your IT and business needs.

The HP Care Pack service for HP ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.

HP Care Pack services for the c7000 enclosures cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP supported c-Class enclosure devices including pass thru, Ethernet interconnect and virtual connect modules are also covered by the c7000 enclosure Care Pack services.

NOTE: SAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 enclosure Care Packs, SAN/Fabric switches carry separate Care Packs. SAN/Fabric Switch Care Pack service level support should always be uplifted to match existing storage or server service level.

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a HP BadeSystem server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - Simplify ProLiant solution implementation, maintenance and management.

- Support Service- 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- Deployment Service - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - Optimize service level to increase IT performance and availability

- Support Service - HP Proactive BladeSystem Service, 1-Year
- Deployment Service - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices
http://www.hp.com/go/proliant/carepack

Quad-Core Models

HP ProLiant BL680c G5 2.4/2x4M,80W (2P) 443528-001	Processor(s) One of the following depending on model	(2) Quad-Core Intel® Xeon® Processor E7340 (2.40 GHz/2x4M 80W) (2) Quad-Core Intel® Xeon® Processor E7330 (2.40 GHz/2x3M 80W) (2) Quad-Core Intel® Xeon® Processor E7320 (2.13 GHz/2x2M 80W) (2) Quad-Core Intel® Xeon® Processor E7310 (1.60 GHz/2x2M 80W)
HP ProLiant BL680c G5 2.4/2x3M, 80W (2P) 449316-001	Cache Memory One of the following depending on model	2x4MB Level 2 cache memory 2X3MB Level 2 cache Memory 2X2MB Level 2 Cache Memory
HP ProLiant BL680c G5 2.13/2x2M,80W (2P) 443529-001	Memory	8 GB (4 x 2 GB) PC2-5300, FBD DDR2-667
	Network Controller	Four (4) embedded NIC ports, plus one (1) additional management NIC port: • Two (2) embedded NC373i Multifunction Gigabit Server Adapters • One (1) NC326i Dual Port Gigabit Server Adapter • One (1) additional embedded 10/100 NIC dedicated to iLO 2 management
HP ProLiant BL680c G5 1.6/2x2M,80W (2P) 443530-001	Storage Controller	HP Smart Array P400i Controller with 256MB (optional BBWC)
	Hard Drives	No drives included; two (2) SFF SAS/SATA drive bays
	Internal Storage	292GB SAS 240GB SATA
	Optical Drive	None
	Form Factor	Up to 8 full-height blades supported in the HP BladeSystem c7000 Enclosure

NOTE: HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Blade.
NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.
NOTE: FIO indicates that this option is a Factory Installable Option.
NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

Step 1: Base Server Blade Configuration (Select a configurable Blade)

Models	HP ProLiant BL680c G5 CTO Blade	443527-B21
	Configurable Model ships with:	
	Four (4) embedded NIC ports, plus (1) additional NIC port for management: • One (1) NC326i Dual Port Gigabit Server Adapter • Two (2) embedded NC373i Multifunction Gigabit Server Adapters • One (1) additional embedded 10/100 NIC dedicated to iLO 2 management	
	Integrated HP Smart Array P400i Controller with 256MB cache supporting RAID 0/1/5 NOTE: Controller cache module selection is required. Select either the standard 256 MB module or the 512 MB module with BBWC upgrade in step 2 below. Four (4) small form factor (SFF) SAS/SATA hot-plug hard drive bays Integrated Lights-Out 2 Standard Blade Edition	

Step 2: Choose Required Options (one of the following from each list unless otherwise noted):

Processors	Quad-Core Intel Xeon Processor E7340 (2.40GHz/2x4M 80W QC 2P kit) Option Kit, FIO Base	443691-L21
	Quad-Core Intel Xeon Processor E7330 (2.40 GHz/2x3M 80W QC 2P kit) Option Kit, FIO Base	449321-L21
	Quad-Core Intel Xeon Processor E7320 (2.13 GHz/2x2M 80W QC 2p kit) Option Kit, FIO Base	443692-L21
	Quad-Core Intel Xeon Processor E7310 (1.86 GHz/2x2M) Option Kit, FIO Base	443693-L21
	Quad-Core Intel Xeon Processor L7345 (1.86 GHz/2x4M 50W QC 2p Kit) Option Kit, FIO Base	450963-L21
	Dual-Core Intel Xeon Processor E7220 (2.93 GHz/2x4M 80W DC 2P kit) Option Kit	450961-L21
Memory	1 GB FBD PC2-5300 2 x 512 MB Kit	397409-B21
	2 GB FBD PC2-5300 2 x 1 GB Kit	397411-B21
	4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21
	8 GB FBD PC2-5300 2 x 4 GB Kit	397415-B21
	NOTE: Two-way memory interleaving is enabled when an identical pair of DIMMs is installed.	
	NOTE: Two-way memory interleaving is enabled when an identical pair of DIMMs is installed.	
Smart Array P400i upgrade options	HP Smart Array P400i 256MB Cache, FIO	405139-B21
	HP Smart Array P400i 512MB and Battery-backed write cache upgrade	405148-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, including server blade enclosures, interconnect options and power subsystem options; please see the following QuickSpecs:
HP BladeSystem c-Class Infrastructure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.HTML
and HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_na/12524_na.HTML

Options

Ethernet Mezzanine Options	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem	416585-B21
	HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem	406771-B21
	HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem	406770-B21
	HP NC512m Dual Port 10GbE Multifunction BL-c Adapter NOTE: An NC512m network adapter card is required for each server blade connecting to the HP 10Gb Ethernet BL-c Switch. NOTE: A maximum of one NC512m is supported per server in a type II mezzanine slot. NOTE: The NC512m requires 4GB of server memory.	440910-B21
Fibre Channel Mezzanine Options	Emulex LPe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter	403621-B21
	QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem NOTE: Supports HP c-Class BladeSystems	403619-B21
HP InfiniBand Mezzanine Options	HP 4X DDR IB DUAL PORT Mezzanine HCA for HP BladeSystem c-Class	448262-B21
	HP 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	410533-B21
	HP HPCD 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	409377-B21
c-Class Mezzanines	HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class NOTE: Required to support the HP StorageWorks SB40c Storage Blade (P/N 411243-B21) with HP c-Class BladeSystem full-height server blades.	431643-B21
HP StorageWorks SB40c Storage Blade	HP StorageWorks SB40c Storage Blade NOTE: Please see the SB40c Storage Blade QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/12587_na/12587_na.HTML NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class (P/N 431643-B21) is required to support the HP StorageWorks SB40c Storage Blade with HP c-Class BladeSystem full-height server blades.	411243-B21

Options

ProLiant Essentials Value Pack Software	**ProLiant Essentials Rapid Deployment Pack**	
	ProLiant Essentials Rapid Deployment Pack No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: This license allows 1 server to be deployed and managed via RDP. NOTE: For additional ProLiant Essentials Rapid Deployment Pack License Kits- please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_na/11053_na.HTML	452151-B21
	ProLiant Essentials Server Migration Pack	
	ProLiant Essentials Server Migration Pack, Single-Migration License NOTE: Contains one license, enabling 1 server migration, with a unique license activation key and documentation. NOTE: This license allows 1 server to be migrated from a physical server to a virtual machine. Or this license can be used to migrate a virtual machine from one virtualization layer i.e. VMware GSX to a different virtualization layer such as VMware ESX or Microsoft Virtual Server 2005. NOTE: For additional ProLiant Server Migration Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_na/12328_na.HTML	435663-B21
	ProLiant Essentials Server Migration Pack - Physical to ProLiant Edition	
	ProLiant Essentials Server Migration Pack - P2P Edition, 1- Migration License, - License Only, No Media NOTE: This license allows 1 migration. Contains one license with a unique license activation key and documentation. NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12467_na/12467_na.HTML	417435-B21
	ProLiant Essentials Virtual Machine Management Pack	
	ProLiant Essentials Virtual Machine Management Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: For use with a single server. Contains one license with a unique license activation key and documentation. NOTE: For additional ProLiant Virtual Machine Management Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_na/12328_na.HTML NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information. NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: http://www.hp.com/servers/proliantessentials.	452153-B21

Options

Remote Management	**Insight Control Environment for BladeSystem**	
	HP Insight Control Environment for BladeSystem, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: Contains 1 license for each of RDP, PMP, VPM, IPM and iLO Select. Includes one year of 24 x 7 HP Software Technical Support and Update Service	453484-B21
	HP Insight Control Management Software Media Kit NOTE: Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates. NOTE: For additional HP Insight Control Environment, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.HTML	436222-B21
	HP Insight Power Manager (IPM)	
	HP Insight Power Manager, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: Customers purchasing this upgrade must already have an iLO Advanced or Select license on each managed server NOTE: For additional -HP Insight Power Manager Packs please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12623_na/12623_na.HTML	452677-B21
	HP iLO Power Management Pack for BladeSystems	
	HP iLO Power Management Pack for BladeSystem, No Media, 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: This option kit includes 1 license for iLO Select and Insight Power Manager. NOTE: For additional -HP Insight Power Manager Packs please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12632_na/12632_na.HTML	442937-B21
	Integrated Lights-Out Select Pack	
	ProLiant Essentials Integrated Lights-Out Advanced Pack, No Media, 1-Server License Featuring: Sophisticated remote control and security features for HP BladeSystem servers and ProLiant ML/DL servers. NOTE: For additional ProLiant Essentials Integrated Lights-Out Value Packs please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.HTML	452158-B21

Options

HP Insight Control Linux Edition	HP Insight Control Linux Edition - MEDIA KIT NOTE: This optional Media pack CD contains the ISO image for the HP Insight Control Linux Edition management appliance (see support servers below under "Management appliance (host) supported servers"). Servers must be acquired separately. For information on HP ProLiant Servers please visit: http://h18000.www1.hp.com/products/quickspecs/North_America/11070.html NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/controltower (click on Download button from this page).	412956-B22
	HP Insight Control Linux Edition 1.6 -No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: This license allows one (1) server blade to be deployed and managed via HP Insight Control Linux Edition.	452155-B21
	HP Insight Control Linux Edition 1.6,No Media, 8-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: This license allows eight (8) server blades to be deployed and managed via HP Insight Control Linux Edition.	452156-B21
	HP Insight Control Linux Edition 1.6, No Media, Flexible-Quantity License, including 1 year of 24x7 Technical Support and Updates NOTE: For use with multiple servers (minimum of 5). This part number allows you to specify the license quantity. When ordering this part number, the quantity ordered will be the number of licenses embedded in a single activation key. A single kit containing that key is then delivered to you.	452157-B21
Processor	Quad-Core Intel® Xeon® Processor E7340 (2.40/2x4M 80W 2P) Option Kit	443691-B21
	Quad-Core Intel® Xeon® Processor E7330 (2.40/2x3M 80W 2P) Option Kit	449321-B21
	Quad-Core Intel® Xeon® Processor E7320 (2.13/2x2M 80W 2P) Option Kit	443692-B21
	Quad-Core Intel® Xeon® Processor E7310 (1.60/2x2M 80W 2P) Option Kit	443693-B21
	Quad-Core Intel® Xeon® Processor L7345 (1.86/2x4M 50W 2P) Option Kit	450963-B21
	Dual-Core Intel Xeon Processor E7220 (2.93 GHz/2x4M 80W DC 2P kit) Option Kit	450961-B21
Memory	1 GB FBD PC2-5300 2 x 512 MB Kit	397409-B21
	2 GB FBD PC2-5300 2 x 1 GB Kit	397411-B21
	4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21
	8 GB FBD PC2-5300 2 x 4 GB Kit	397415-B21

Options

Hard Drives	Serial Attached SCSI (SAS) SFF Hot Plug	
	HP 72GB 3G SAS 15k SFF DP HDD	418371-B21
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 36GB 3G SAS 15k SFF DP HDD	418369-B21
	HP 36GB 3G SAS 15K SFF SP HDD	431933-B21
	HP 146GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 146GB 3G SAS 10K SFF HDD	431958-B21
	HP 72GB 3G SAS 10K SFF DP HDD	384842-B21
	HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 36GB 3G SAS 10K SFF SP HDD	375859-B21
	NOTE: SAS drives have a 3 year warranty. NOTE: Please see the SAS Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.HTML	
	SFF SATA Hot Plug	
	HP 120GB 1.5G SATA 5.4K SFF HDD	431786-B21
	HP 60GB 1.5G SATA 5.4K SFF HDD	379306-B21
	NOTE: SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.HTML	
Storage Controllers	P400i Battery-backed write cache upgrade	383280-B21
	P400i 512MB and Battery-backed write cache upgrade	405148-B21
HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000	201723-B22
	NOTE: Please see the Modular Smart Array 1000 QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML	

Options

Cluster Options	NOTE: For configuration/certification options for the HP Parallel Database Cluster for Oracle RAC please go to: http://www.hp.com/solutions/highavailability/oracle	
	NOTE: For additional information regarding the HP ProLiant Cluster for HA/F500 please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10232_na/10232_na.html	
	ProLiant Cluster Starter Kit NOTE: For additional information regarding the ProLiant Cluster Starter Kit please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11935_na/11935_na.html	364023-B22
	HP HA/F200 for Entry SAN Cluster	364026-B22
	ProLiant Cluster HA/F500 for the Enterprise SAN NOTE: For additional information regarding the ProLiant Cluster HA/F500 for Enterprise SAN please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11933_na/11933_na.html	364024-B21
	HP Serviceguard for Linux ProLiant Cluster, A.11.18 (2 license version - Red Hat EL 4&5, SUSE SLES9&10)	307754-B27
	HP Serviceguard for Linux A.11.16 for SUSE SLES 9 & 10 and Red Hat EL 3 & 4 (single license version)	307754-B26
	HP Serviceguard for Linux, A.11.18 (single license version - Red Hat EL 4&5, SUSE SLES9&10)	305199-B27
	HP Serviceguard for Linux ProLiant Cluster A.11.16 for SUSE SLES 9 & 10 and Red Hat EL 3 & 4 (2 node license cluster kit)	305199-B26
	HP Serviceguard for Linux and Red Hat Global File System - 1 year subscription	T2798AA#001
	HP Serviceguard for Linux and Red Hat Global File System - 3 years subscription	T2798AA#003
	NOTE: For additional information regarding the HP Serviceguard for Linux License, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html	

USB Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
	External USB 2.0 Multi-Bay II Cradle	PA509A
	Multibay II 9.5mm DVD Drive	PA849A
	USB 2.0 4-port Hub	DG954A
	HP USB 04 Standard Keyboard	DT528A#ABA

Service and Support Offerings (HP Care Pack Services)	NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	Hardware Services On-site Service	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE458E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE459E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE460E
	Support Plus 24	

Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	UE473E
NOTE: HP Care Pack services for the c7000 enclosure cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP supported c-Class enclosure devices including pass thru, Ethernet interconnect and virtual connect modules are also covered by the c7000 enclosure Care Pack services.	
NOTE: SAN/Fabric storage blade switches Limited Warranty includes 1 year parts, 1 year labor, 1 year on-site support.	
NOTE: SAN/Fabric storage blade switches for the HP c-Class BladeSystem are not covered under the c7000 enclosure Care Packs, SAN/Fabric storage blade switches carry separate Care Packs. SAN/Fabric Blade Switch Care Pack service level support should always be uplifted to match existing storage or server service level.	
Hardware Services On-site Service	
Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic NOTE: Uplifts the Ethernet devices to the same level of warranty as the c-class enclosure	UE477E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE478E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE479E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE480E
Installation & Start-up Services	
HP BladeSystem c-Class Infrastructure Installation and Startup Service, Electronic	UE602E
HP BladeSystem Enhanced Network Installation and Startup Service, Electronic	UE603E
ProLiant BL c-Class Blade Server Hardware Installation, Electronic	UE493E
ProLiant BL c-Class Enclosure and Server Blade Hardware Installation, Electronic	UE494E
NOTE: For more information, customer/resellers can contact http://www.hp.com/services/bladesystemservices	
NOTE: The HP Care Pack service part numbers below covers the HP SB40c Storage Blade.	
Installation & Start-up Services	
Hardware Installation, Electronic	UF213E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UF207E
NOTE: The HP Care Pack service part numbers below covers the HP InfiniBand Adapter for c-Class BladeSystem.	
Installation & Start-up Services	
Hardware Installation, Electronic	HC046E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UA248E
NOTE: The HP Care Pack service part numbers below covers the HP Storage Tape Blade.	
Installation & Start-up Services	
Hardware Installation, Electronic	U2090E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	H4622E
NOTE: The HP Care Pack service part numbers below covers the HP Brocade 4Gb, 12 Port SAN Switch and Brocade 4/24 SAN Switch.	
Hardware Services On-site Service	
Hardware Installation, Electronic	U5988E

4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, (12 port) Electronic	UC009E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, (24 port) Electronic	UE438E
Support Plus	
Onsite Hardware support, 8am-9pm, M-F, 4-hour response and Software Technical support offsite, onsite at HP's discretion, 8am-9pm, M-F 2-hour response time excluding HP holidays, Electronic	UE728E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, (24 port) Electronic	UC019E
Support Plus 24	
Onsite Hardware support 24x7, 4-hour response and software Technical support offsite, onsite at HP's discretion, 24x7 2-hour response time including HP holidays, Electronic	UE729E
Software Installation and StartUp Services	
Provides for the Installation and Start-up of ProLiant Essentials Rapid Deployment Pack, Electronic	U5683E
NOTE: Provides installation on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days.	
Provides for the Installation and Start-up of Rapid Deployment Pack Implementation of Rapid Deployment Pack (Basic) (Electronic)	UA042E
Provides for the Installation and Start-up of System Insight Manager (Electronic)	UA041E
Provides for the Installation and Start-up of System Insight Manager Agents (Electronic)	UA040E
Provides for the Installation and Startup of Insight Control - Linux Edition	UF369E
Provides for the Installation and Startup of Virtual Machine Management & Server Migration Pack	UD546E
Software Operating Environment Care Packs	
NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/carepack/services/	
HP Proactive BladeSystem Service Care Pack	
1 Year, HP Proactive BladeSystem Service	UG858E
NOTE: For more information, customer/resellers can contact http://www.hp.com/services/proactivebladeservice	

Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

DIMM installation guidelines:

1. All DIMMs must be PC2-5300 Fully Buffered DIMMs running at 667 MHz.
2. Both DIMM slots in a memory bank must be populated.
3. Banks must be populated in sequential alphabetic order, starting with bank A.
4. Both DIMMs in a memory bank must be identical. Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.
5. Multiple advanced memory protection (AMP) modes are supported, based on FBDIMM population and RBSU selection. The server blade defaults to Advanced ECC.

HP ProLiant BL680c Server G5 (1P Model)

Standard Memory

8-GB (4 x 2GB) of PC2-5300, FBD DDR2-667 ECC DIMMs

Standard Memory Plus Optional Memory

Up to 56-GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

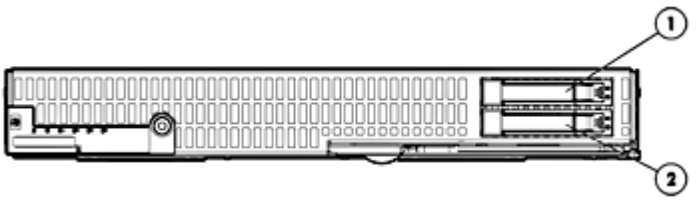
Up to 64 GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the removal of standard memory and the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Memory		Slot							
Standard	8-GB	1A	2C	3E	4G	5A	6C	7E	8G
		2GB	Empty	Empty	Empty	2GB	Empty	Empty	Empty
		9B	10D	11F	12H	13B	14D	15F	16H
		2GB	Empty	Empty	Empty	2GB	Empty	Empty	Empty
Optional	56-GB	1A	2C	3E	4G	5A	6C	7E	8G
		2GB	4GB	4GB	4GB	2GB	4GB	4GB	4GB
		9B	10D	11F	12H	13B	14D	15F	16H
		2GB	4GB	4GB	4GB	2GB	4GB	4GB	4GB
Maximum	64GB	1A	2C	3E	4G	5A	6C	7E	8G
		4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB
		9B	10D	11F	12H	13B	14D	15F	16H
		4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB

HP ProLiant BL680c Server Blade G5

Following are memory options available from HP:

1GB FBD PC2-5300 2X512MB Kit	397409-B21
2GB FBD PC2-5300 2X1GB Kit	397411-B21
4GB FBD PC2-5300 2x2GB Kit	397413-B21
8GB FBD PC2-5300 2x4GB Kit	397415-B21



1-2 2 x SFF SAS or SATA hot-plug hard drives

Hard Drives

SAS Hard Drive

	Quantity Supported	Position Supported	Controller
72GB 15,000 rpm SFF SAS 36GB 15,000 rpm SFF SAS 146GB 10,000 rpm SFF SAS 72GB 10,000 rpm SFF SAS 36GB 10,000 rpm SFF SAS	2	1-2	Smart Array P400i Controller

Serial-ATA (SATA) Hard Drive

	Quantity Supported	Position Supported	Controller
120GB 5,400 rpm SFF SATA 60GB 5,400 rpm SFF SATA	2	1-2	Smart Array P400i Controller

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
Modular Smart Array 1000	Please see the Modular Smart Array 1000 QuickSpecs below to determine configuration requirements	External	Please see the Modular Smart Array 1000 QuickSpecs (URL below) for the latest list of supported HBAs

Modular Smart Array 1000:
http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML

Power Specifications

NOTE: To review maximum system power ratings for facilities planning purposes use the Active Answers Blade Power Sizer which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator

System Unit	Dimensions	Height	14.42 in (36.63 cm)
		Depth	20.06 in (50.9 cm)
		Width	2.03 in (5.14 cm)
	Weight	Maximum	21.02 lbs (9.53 kg)
	Temperature Range*	Operating	10° to 43° C (50° to 109° F)
		Non-Operating	-40° to 60° C (-40° to 140° F)
		Storage	-20° to 60° C (-4° to 140° F)
		Maximum Wet Bulb Temperature	30° C (86° F)
	Relative Humidity**	Operating	10% to 90%
		Shipping	10% to 90%
		Storage	10% to 95%

*NOTE: All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Upper operating limit is 3,048m (10,000 ft) or 70 Kpa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft) or 30.3 KPa/4.4 psia.

**NOTE: Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Smart Array P400i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x8 2.5G PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x8 3G SAS provides 2.4GB/s maximum bandwidth.
	Cache Memory	40-bit 256MB cache (72-bit 512MB module upgrades available); ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	584GB (4 x 146GB) SAS 480GB (4 x 120GB) SATA
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware with recovery ROM feature

Technical Specifications

Embedded NC326i Dual Port Gigabit Server Adapter	Network Processor	Broadcom 5715S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	Two ports, each at 1000 Mb/s (Theoretical Maximum Values)
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	• 9K Jumbo frames • TCP/IP checksum offload (TCO) • Large send offload (LSO) • Interrupt coalescence • Dual address cycles (DAC) • Wake-on-LAN (WOL) • Pre-boot execution environment (PXE) • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Windows
Embedded NC373i Multifunction Gigabit Server Adapters	Network Processor	Broadcom 5708S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	1000 Mb/s (theoretical maximum values)
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	• TCP/IP offload engine (TOE) for Microsoft Windows • 9K Jumbo frames • TCP/IP checksum offload (TCO) • Large send offload (LSO) • Interrupt coalescence • Dual address cycles (DAC) • Wake-on-LAN (WOL) • Pre-boot execution environment (PXE) • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Windows
Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.